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# PUBLIC HEALTH ACT

(11 & 12 Vict. Cap. 63.)

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## REPORT

TO THE

# GENERAL BOARD OF HEALTH

ON A

## PRELIMINARY INQUIRY

INTO THE SEWERAGE, DRAINAGE, AND SUPPLY OF  
WATER, AND THE SANITARY CONDITION  
OF THE INHABITANTS

OF THE BOROUGH OF

# B E D F O R D,

By WILLIAM LEE, Esq.,

CIVIL ENGINEER, SUPERINTENDING INSPECTOR.



LONDON :

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PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY,

FOR HER MAJESTY'S STATIONERY OFFICE.

1855.

## NOTIFICATION.

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THE General Board of Health hereby give notice, in terms of section 9 of the Public Health Act, that on or before the 12th day of April next, being a period of not less than one month from the date of the publication and deposit hereof, written statements may be forwarded to the Board with respect to any matter contained in or omitted from the accompanying Report on a Preliminary Inquiry into the Sewerage, Drainage, and Supply of Water, and the Sanitary Condition of the Inhabitants, of the Borough of Bedford, or with respect to any amendment to be proposed therein.

By order of the Board,  
T. TAYLOR, *Secretary.*

*Whitehall, February 27, 1855.*

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## PUBLIC HEALTH ACT (11 & 12 Vict. c. 63.)

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*Report to the General Board of Health on a Preliminary* BEDFORD.  
*Inquiry into the Sewerage, Drainage, and Supply of  
Water, and the Sanitary Condition of the Inhabitants,  
of the Borough of BEDFORD.* By WILLIAM LEE, Civil  
Engineer, Superintending Inspector.

MY LORDS AND GENTLEMEN, 7, Duke Street, Westminster,  
16th November 1854.

I BEG to present to you my report on the sanitary condition of the borough of Bedford; with copies of the minutes of my inspection, and of the evidence given at the inquiry, appended.

The inquiry was directed in consequence of a petition, the heading of which is in the usual form. At the end of the signatures there is a certificate, of which the following is a copy:—

“I, *Joseph Joy*, of Bedford, collector of rates within the borough of Bedford, do hereby certify that the number of persons rated to the relief of the poor within the borough of Bedford, from which place the above petition professes to come, amounts to 1673; and that all the persons, amounting to 177, whose signatures are subscribed to the said petition (with the exception of *two*), are rated to the relief of the poor within the district of Bedford.

(Signed) “JOSEPH JOY.”

The petition is signed by many of the most influential of the inhabitants, including three physicians, five surgeons, three magistrates, and nine clergymen.

Having been directed by the Board to proceed with the inquiry, I caused public notice to be given, and the inquiry was opened in the Shire Hall of Bedford on the 10th day of May, at the hour of 10 in the morning; and continued from day to day until the 13th, when it was adjourned until the 31st day of the same month. On that day the inquiry

**BEDFORD.** was resumed, and continued until the 3d day of June, when I had completed a careful inspection of the whole borough, and had heard all persons desirous of being heard before me touching the inquiry.

At the opening of the inquiry it was proved, by William Sargent, John George, and Mrs. Bailey, that the public notices had been duly affixed upon the doors of all "the principal churches, chapels, public buildings, and places where public notices are usually affixed;" and copies of the *Bedford Mercury* and *Bedford Times* were put in, containing the same as an advertisement. A duplicate of the notice accompanies this report.

There was a large attendance of the inhabitants, and much interest manifested in the proceedings.

After explaining the most convenient manner of conducting the inquiry, I entered upon my minutes the names of such places as were specially complained of, and the nature of the complaints.

It would occupy too much space to set out the whole of the places named, and therefore I refer the Board to my minutes for the particulars. Such complaints of sanitary defects amount to at least 40,—a number larger than I recollect to have been voluntarily made at the opening of any inquiry which I have made under the Public Health Act.

The borough of Bedford comprising five parishes, I requested that I might be accompanied during my inspection by a few of the inhabitants of each parish. This was gladly acceded to, and I derived much assistance from the following:—

*St. Peter's.*—The Rev. Gustavus Burnaby; James Wyatt, Esq.; Mr. Charles Read, Mr. John Usher.

*St. Paul's.*—The Rev. Richard Fitzpatrick; Dr. H. Barker; Henry Verey, Esq.; Mr. Joseph Allen.

*St. Mary's.*—The Rev. Charles Brereton; Dr. G. F. D. Evans; Mr. Samuel Lovell, Mr. Charles Berrill.

*St. John's.*—The Rev. Henry Pearse; Isaac Elger, Esq. J. P.

*St. Cuthbert's.*—The Rev. Charles Trollope; Mr. James Woodroffe, Mr. John Wilson.

I was accompanied throughout the inspection by Mr. Richard Stennett, chief constable of the borough, and inspector of nuisances.

MINUTES OF INSPECTION.

BEDFORD.

I beg respectfully to urge upon the Board an examination of the minutes of my inspection appended hereto. They disclose a large amount of sanitary evil arising from offensive privies, often close to houses, but more frequently near to water-wells. The cesspools in a considerable proportion of the town have direct communication with the water-wells. A large number of houses are destitute of any water, and many cottages are unfit for human habitation. After being only accustomed to see the fair outside of the town, it was remarked, by several of the gentlemen who accompanied me, that they could not have believed in the existence of such places.

EVIDENCE GIVEN AT THE INQUIRY.

Bearing in mind the request of the Board that I would bring my report into as small a compass as possible, I have experienced very great difficulty from the voluminous character of the evidence given at the inquiry. There is in Bedford, as in many other towns, considerable difference of opinion as to the application of the Public Health Act, and the statements of both sides were brought before me. In the execution of my duty, I was bound not only to obtain the information required for my report, but also to *hear all persons desirous of being heard before me*. Owing to the strong local feeling for and against the application of the Act, I have now to deal with a larger amount of evidence than I have generally received in towns several times as large as Bedford. I should be chargeable with partiality if I were to suppress it; and I have, therefore, determined to tabulate and condense all the statistical information, and to give in the body of my report only an abridgment of the more important parts of the evidence, appending such evidence in full for the further information of the Board. It will be obvious that this course involves much additional labour, but I should have been unable otherwise to comply with the wishes of the Board.

GENERAL DESCRIPTION.

It is unnecessary for me to enter into any historical or topographical account of Bedford. It is one of the boroughs in Schedule A. of the Municipal Corporation Act, and has a grant of a separate quarter sessions, and is in the centre of a

**BEDFORD.** poor law union comprising 44 parishes, and contains nearly all the public and charitable institutions of the county. It will be seen that these institutions are made to have an important bearing on this inquiry. The geological character of the sub-strata is that of the lias formation, and there are beds of limestone at some depth under the town and its immediate neighbourhood. From this cause all the deep well-waters of the town are hard. In the valley of the river Ouse—which passes through the town—there is a considerable deposit of porous alluvium between the limestone and the surface of the ground. This alluvium contains water, called land-springs, but really only soakage water, held up by the obstructions placed across the river. A great number of the water-wells only go down into the soakage; and more than 3,000 cesspools are said to go into the same. *The water both in cesspools and in wells is said to rise and fall with the river, on the gravel substrata in the lower part of the town.*

The immediate site of the whole of the town may be described as flat, and the sub-soil not only undrained, but incapable of efficient drainage by any existing jurisdiction.

The town is famous for its charitable and educational institutions; and I am so far from desiring to depreciate its prosperity, that I say without hesitation, it is naturally a very healthy locality. But the truth must not be concealed; and nothing could be more clearly proved than that, by municipal and other local neglect, it has been made, and is now, a very unhealthy town; and that well considered but prompt sanitary improvements will be the most effectual way of making it a desirable place of residence, and of promoting its permanent prosperity.

#### POPULATION, NUMBER OF HOUSES, &C.

The borough of Bedford includes the five entire parishes of St. Cuthbert, St. John, St. Mary, St. Paul, and St. Peter. The aggregate area is 2,220 acres.



TABLE No. 1.  
BOROUGH OF BEDFORD.—POPULATION AND HOUSES.

Parish.	Population.						Houses.		
	1801.	1811.	1821.	1831.	1841.	1851.	1831.	1841.	1851.
Saint Cuthbert - - -	351	479	578	733	591	663	159	157	173
Saint John - - -	254	324	352	486	446	453	93	94	95
Saint Mary - - -	616	690	808	879	1,042	1,670	162	189	277
Saint Paul - - -	2,150	2,489	3,075	3,956	5,895	6,709	831	1,301	1,498
Saint Peter - - -	577	623	653	905	1,204	2,198	205	226	415
Totals - - -	3,948	4,605	5,466	6,959	9,178	11,693	1,450	1,967	2,458

The population of the parish of Saint Cuthbert decreased from 1831 to 1841. This is attributed in the census returns to the dilapidation of the houses, which caused the inhabitants to remove to other parts of the town.

In the census returns of 1851 it is stated, that the increase in the population of the borough is ascribed to the railway establishment, and to the immigration of persons from other parts, which has led to the extension of building.

BEDFORD.

TABLE No. 2.

## BOROUGH OF BEDFORD.—INMATES OF PUBLIC INSTITUTIONS.

THE following TABLE shows the INMATES of the PUBLIC INSTITUTIONS at three several periods, in order that the MORTALITY of the same places may be duly appreciated.

Parish.	Name of Institution.	Inmates.		
		1831.	1841.	1851.
Saint Mary's Parish	County Infirmary	75	108	100
Ditto	County Lunatic Asylum	58	129	284
Paul	County Gaol	67	107	154
Peter	Workhouse	89	219	313
	Totals	289	563	851

TABLE No. 3.

RATEABLE VALUE OF PROPERTY.

The following TABLE shows the NUMBER of HOUSES at various rateable VALUES, and the rateable Value of Property in each PARISH.

PARISH.	Number of Houses rated at													Total Number of Houses.	Total Rateable Value of			Aggregate Rateable Value of all Property.										
	Under 1l. 10s.	1l. 10s. and under 2l.	2l. and under 3l.	3l. and under 4l.	4l. and under 5l.	5l. and under 6l.	6l. and under 6l. 10s.	6l. 10s. and under 7l.	7l. and under 8l.	8l. and under 9l.	9l. and under 10l.	10l. and under 15l.	15l. and under 20l.		20l. and under 30l.	30l. and under 40l.	40l. and under 50l.		50l. and under 60l.	60l. and upwards.	Houses.	Other Buildings.	Land.					
		£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.		£	s.	d.		£	s.				d.	£	s.	d.	
St. Cuthbert	29	40	6	11	16	28	8	2	3	7	10	5	-	6	1	-	-	3	175	1,142	0	6	802	1	10	1,970	16	10
St. John	-	-	4	27	7	11	3	1	11	1	1	19	11	-	1	1	-	-	98	784	16	0	68	0	0	942	16	0
St. Mary	-	-	12	22	15	34	29	2	18	3	14	43	27	40	2	12	5	8	286	4,256	13	6	1,295	5	8	6,371	0	10
St. Paul	-	5	12	184	240	85	28	42	70	38	64	152	103	77	64	34	15	34	1,476	18,040	18	1	1,870	8	2	20,828	11	8
St. Peter	-	5	36	53	118	27	35	3	19	26	5	46	23	39	11	6	3	1	456	4,112	6	0	930	15	0	5,331	1	0
The Borough	39	52	242	353	385	185	103	50	121	75	94	265	164	162	79	53	23	46	2,491	28,336	14	1	4,966	10	8	35,444	6	4

## BEDFORD.

## TRADE AND MANUFACTURES.

There are no trade avocations carried on capable of being injurious to the health of the inhabitants. Indeed, it would be difficult to find a population of about 12,000 persons more favourably situated in this respect.

According to the statement of one of the witnesses, there is one public house to every 27 families throughout the town, but only one baker to 86 families.

## STATE OF DISEASE AND CAUSES OF MORTALITY.

The evidence given by the medical practitioners of the town is so extensive that I shall, under this head of my report, only advert to some of the most important of their statements.

*Paris Dick*, Esq., physician to the Bedford Infirmary and Fever Hospital, gives a general exposition of sanitary principles, in which I cordially concur. He then applies his remarks to the town of Bedford. He considers the sewerage in the most crowded parts disgraceful, and that many of the poorer townsmen are living in the deepest physical and social degradation. He states that zymotic and epidemic diseases prevail in Bedford to a much greater extent than in other towns of similar population; and that such diseases are the results of the unfavourable circumstances in which a large mass of the poor live. He considers it the duty of the more influential, as citizens and Christians, to rescue their poorer brethren from the inroads of disease; and is convinced that, with proper sanitary improvements, Bedford would soon become one "of the most healthy—instead of, as it now stands, one of the "dirtiest—towns in England."

*Wm. Blower*, Esq. has been practising as a surgeon in Bedford nearly 30 years, and was mayor at the time of my inquiry. He is also one of the medical officers of the Union. He had experience of the cholera in 1832 and also 1849, and gives a chronological account of the numerous epidemics that have afflicted the town, with the names of the localities they always visit. He states that there are numerous cess-pools, even in High Street, and that he considers them "prolific sources of fever." I need not dwell on the fearful conclusions to be drawn, as to the sanitary condition of houses, from Mr. Blower's experience, when he says, "I have frequently seen cases of fever occur in houses situated near pits of water *which is used for food and domestic purposes*, when, after a dry summer, the water

“has evaporated, and a muddy surface has been left.” He BEDFORD. says most of the new houses for the poor are built upon a damp soil without any arrangement for dry floors;—that he has seen many cases of fever arise from that cause, and that there is no legal power to remedy the evil.

The localities of cholera, diarrhœa, typhus, measles, &c., pointed out by Mr. Blower, are found in the minutes of my inspection to be distinguished for their defective sanitary condition. He concludes with the opinion that some diseases of the zymotic class “might and ought to be prevented; and that many of these diseases which I do not consider preventible might be greatly mitigated by proper sanitary arrangements.”

*Isaac Elger*, Esq., practised as a surgeon in Bedford from 1828 to 1844. He is one of the borough magistrates, and the owner of many houses in the town. He refers to the fact that waterclosets are prohibited by the Local Acts from being turned into the sewers; and, he thinks, very properly so, *because there are no means of flushing them out*. He is of opinion that water ought to be provided for such purposes, and that “there cannot be two opinions on that point.” He refers to the damming up of the river for mill purposes, and thinks this a monster difficulty that ought to be grappled with. He says it is a fact that cannot be disputed, that the supply of water to the poor is deficient; and that it would be very beneficial to the sanitary condition of the town if there were such a supply of water by public works, that the cottages could be supplied with taps for  $1\frac{1}{4}d.$  or  $1\frac{1}{2}d.$  per week per house. He has the same opinion as to the advantages of an economical and efficient system of drainage; and, knowing that the owners would be liable for the rates on cottages, he would not oppose such improvements on that account. I trust that Mr. Elger’s example would be followed by all owners of cottages in Bedford.

*G. F. D. Evans*, Esq., is physician to the Bedford Infirmary and Fever Hospital. He refers to the fever localities in the parish of St. Mary, where he resides; and considers that such a state of things exists there as is calculated to generate fever. He gives a list of the diseases most prevalent in Bedford, and says that the fever “is generally of a low type, requiring the early use of wine and other stimulants.” He thinks that many of these diseases are evils that man has inflicted on himself by neglect of sanitary measures, and that they might be prevented. With respect to other diseases, he says that

BEDFORD. they might be greatly ameliorated by proper sanitary arrangements; "and even in cases of wounds or injuries "by accidents, they would go on favourably and recover, "or ultimately sink, according to the healthy or unhealthy "condition of the atmosphere the patients breathed, and the "sanitary condition of the localities in which they lived." He is of opinion that a proper supply of water and efficient drainage would be very beneficial to the town; and that a great deal of the disease in Bedford is caused by the bad quality of the water.

*Thomas Herbert Barker*, Esq. M.D., is the author of two very valuable pamphlets on the sanitary condition of Bedford. The former is a "report on the mortality of the "borough of Bedford, and of thirty-nine rural parishes constituting the Bedford Union." The title of the latter is, "Is Bedford Healthy? and if not, why not? and, How can "it be made so?" These pamphlets have caused much inquiry into the subject, and I regret that my limited space prevents reference to their important contents. A copy of each accompanies the papers connected with this report, and I beg respectfully to urge them upon the consideration of the Board.

In his evidence given at the inquiry, Dr. Barker has classified nearly 900 deaths in Bedford from zymotic (i. e. *preventible*) diseases as having occurred within 16½ years. He goes on to remark upon the facts disclosed by the Table, and notices the large proportion of such deaths in St. Paul's parish, where the only public institution is the gaol, the mortality of which is trifling. He says the mortality of children under five years of age in Bedford averages 42 per cent. for the last 16 years. In healthy localities the proportion is only about 27 per cent. He confirms Dr. Evans as to the general low type of fevers in Bedford; and says, "All the diseases that have been specified "are observed particularly in the close, ill-ventilated, and "ill-drained localities." "Bedford is seldom without fever "of a typhoid and fatal character. Fever, small-pox, and "measles exist at the present time in several parts of the "town." Among the causes of disease he refers to the damming up of the river, and the frequent flooding of the meadows; and says that hygrometric observations show a comparative excess of moisture in the air of the town. Imperfect and insufficient sewerage and drainage, he says, is the most evident cause of the excessive disease and mortality of Bedford. He has frequently traced disease to malaria from these causes:—"Accumulations of filth,

“ open privies and cesspools, especially in crowded courts BEDFORD.  
 “ and yards, are other sources of disease.” He gives credit to the Improvement Commissioners and the Board of Guardians for their efforts, but says, “ The filth re-accumulates from the moment of the removal ; and a great change, beyond the power of these bodies to accomplish, is required in order to effect permanent good.” Impure and insufficient water, and the frequent contiguity of wells to cesspools, is adduced ; and Dr. Barker says, “ Diseases of various kinds have been distinctly traceable to contamination of well-water from cesspools.” He adds that this evil is becoming worse and worse every year. He attributes much disease to the bad construction of houses, to the condition of the surface in many of the new streets, and to the offensiveness of the slaughter-houses. He concludes: “ I have the greatest confidence in the entire preventibility of many of the most serious and fatal diseases of the zymotic class by proper sanitary measures.”

*John Harris, Esq.* is visiting surgeon, and superintendent of the county Lunatic Asylum. He is a member of the sanitary committee of the Board of Guardians, and in that capacity has inspected the town. He says, “ I can confirm the worst statements that have been made as to the want of room in the cottages, ventilation, drainage, privies, sewerage, and water supply.” He has known Bedford for 30 years, and that it is not a healthy place ; particularly for strangers, who have complained of sensations and pains, and a state of health that they were previously unacquainted with. Such persons leaving Bedford, even for a few miles, have recovered their health and buoyancy of spirits. He looks upon the present condition of the river, with its frequent floods and the obstacles it creates to town drainage, as one great cause of unhealthiness. He believes that the sums represented by the losses from floods would soon pay for the purchase of the mill. “ In a summer evening any one driving through Bedford would be aware of the defective state of the town by the evidence of the eyes and nose. Bedford would be naturally a healthy place, and if the impediments were sufficiently removed from the course of the river, and the town efficiently drained and well supplied with water, it might be made a very healthy place of residence.”

*William Bailey, Esq.*, one of the medical officers, is not inclined to go to the extent of some as to the unhealthiness of the town, but says “ the drainage is very imperfect and bad in many localities ; and also that there is a very

BEDFORD. "inefficient supply of water of any kind, particularly of "good water." The remainder of Mr. Bailey's evidence is as to the lines and direction of the sewers which he would recommend, and the source and mode of supplying water from public works to the inhabitants. These are engineering questions, into which it would be premature for me to enter at present.

Under this head I would include the statement put in by Mr. *Wm. Markwell Dawson*, whose neighbours and himself have suffered so severely from slaughter-yards and defective drainage. Mr. Dawson has resided in Bedford 34 years, and has considerable property in High Street. The back part overlooks Mr. Colson's butchering premises, and is also near the public slaughter-yard belonging to the Corporation. His own property is of a superior description, with spacious rooms, water-closet and drain from each house, and no cess-pools. Great complaints have been made by his tenants of stench from the slaughter-yards, the drainage and water supply of which are very deficient. He says, "The houses "in High Street, in the immediate neighbourhood of these "slaughter-yards, have never been free from typhus fever "long together for many years past." He then goes on to describe some of the cases as follows:—

"During the autumn of 1849 a tradesman's wife and daughter were attacked with typhus fever, and the wife died. In 1850 another family, in the adjoining house, were all, excepting the husband, attacked with typhus fever of so virulent a kind that they could with difficulty procure a nurse to attend them. About the same time another family was attacked with the disease; and after its continuance in the house for many weeks, two of the children died. In 1853 another large family was taken ill of typhus fever, and it continued in the house many months; one child died. In 1853 and 1854 another large family was attacked with fever. Two of the children had it severely; one of them, a girl twelve years of age, was confined to her bed for four months; and although they both eventually recovered, the results to the family were of a very painful and fatal nature. The mother, from over-exertion and fatigue, was taken ill of bronchitis, and died, leaving a family of eight children."

Mr. Dawson's earnest desire for sanitary improvements will be appreciated, when it is stated that the last case is his own.

The great slaughter-yard, erected under the powers of the Local Improvement Act, is in the centre of the town, and is the property of the Corporation. It is described in the minutes of my inspection, and referred to in very strong terms of condemnation by several witnesses. Mr. Dawson says the exhalations are so powerful as to be not only detri-



mental to health, but even "plated and brass articles and "silver watches are discoloured when hung up inside the "houses."

I am aware that in this condensation I have been unable to do justice to the important depositions of the medical witnesses, and therefore refer to the appendix which contains them at length. I feel bound, however, to say that the state of the town in respect of drainage, water, and nuisances, sufficiently accounts for the large amount of disease and mortality to which they have testified.

VITAL STATISTICS.

This part of my duty has been invested with more than ordinary interest by the labours of Dr. Barker, and by the efforts, sincere I have no doubt, to call in question the conclusions to which he has come.

The following is a Return from the Registrar General, made in accordance with the terms of the Public Health Act.

A RETURN of the Total Number of Deaths in each of the Seven Years ending 1852, with the Proportion of Deaths to 1,000 living during that Period ; also the Number of Deaths in each of the same Years from the Zymotic Class of Diseases, in the Borough of Bedford.

Population in 1841 - - - 9,178  
 Population in 1851 - - - 11,693

Years.	1846.	1847.	1848.	1849.	1850.	1851.	1852.	Total.	Annual Average per 1,000.
Deaths from all Causes - - }	381	366	310	354	273	254	267	2,205	28
Deaths from Zymotic Diseases }	116	119	73	102	60	49	38	557	—

(Signed) GEORGE GRAHAM,  
*General Register Office,* *Registrar General.*  
 29th Nov. 1853.

It was urged upon me by a report of a committee of the town council, and by several witnesses, that the rates of mortality apparent from the registers were fallacious ;

**BEDFORD.** that the excess was caused by the deaths in the public institutions; and that, if these were deducted, the mortality fairly due to the town of Bedford would be found considerably below the average; in fact, that it is now, and has been for years past, so healthy that sanitary interference is unnecessary.

In addition to verifying Dr. Barker's Tables, therefore, I thought it right to make an independent investigation, and to endeavour to estimate the depreciating influence of these public institutions on the death-rates of the borough. In this I have been greatly assisted by S. Wing, Esq., the Superintendent Registrar of the district, who has extracted for me the births and deaths in each parish at large for each of the last seven years; also the deaths in each at various ages, the deaths in public institutions, and from zymotic diseases. With the returns so obtained, I have been able to calculate the Tables numbered 4 to 8 inclusive. Table No. 9 is calculated from the aggregates of the parish returns furnished by Mr. Wing, and therefore represents the whole borough. To these aggregates I have added in No. 9 similar statistics of 61 whole registration districts in England and Wales, for purposes of comparison. The 61 districts include more than a million persons in various parts of the kingdom, and engaged in mining and manufacturing, as well as in agricultural operations. They also include towns as large as Bedford, containing their own public institutions.

TABLE No. 4.  
PARISH OF ST. CUTHBERT—RATES OF MORTALITY.

YEAR.	Population.	Total Number of Deaths.	Total Number of Births.	Mortality to a Thousand of the Population.	Proportion of Deaths to the Population.	Proportion of Births to the Population.	Proportion of Deaths of Infants under One Year to the Births.	Proportion of Deaths from Zymotics to the Population.	Average Age of all who have died.	Average Age of all who have died above Twenty Years.	Proportion per cent. of Deaths, at each interval of Death, to the Total Deaths.												
											Under 1 Year.	Under 5 Years.	Under 15 Years.	Under 20 Years.	Between 20 and 30 Years.	Between 30 and 40 Years.	Between 40 and 50 Years.	Between 50 and 60 Years.	Between 60 and 70 Years.	Between 70 and 80 Years.	Between 80 and 90 Years.	90 Years and upwards.	
1847	634	17	29	26.81	1 in 37	1 in 21	1 in 7	1 in 90	Y. M. 27 0	Y. M. 58 0	23.5	35.2	52.9	58.8	11.7	-	-	-	17.5	5.8	5.8	-	-
1848	641	19	30	29.64	33	21	2	91	Y. M. 23 0	Y. M. 58 0	36.8	57.9	57.9	63.0	-	5.2	5.2	10.4	5.2	5.2	5.2	-	-
1849	648	11	24	16.97	59	27	2	162	Y. M. 19 3	Y. M. 50 0	45.4	54.5	63.0	63.6	-	9.0	9.0	9.0	9.0	-	-	-	-
1850	655	16	22	24.42	41	30	4	168	Y. M. 27 0	Y. M. 56 0	25.0	43.7	50.0	62.5	18.7	-	-	-	-	6.2	-	12.4	6.2
1851	663	13	19	19.60	51	34	3	331	Y. M. 35 3	Y. M. 62 6	30.7	38.3	38.3	46.1	-	-	-	23.1	15.4	7.7	7.7	-	-
1852	671	16	26	23.84	42	25	8	335	Y. M. 42 6	Y. M. 55 0	12.5	18.7	18.7	28.0	12.5	6.2	12.5	16.8	6.2	6.2	6.2	-	-
1853	679	17	20	25.03	39	38	3	226	Y. M. 30 0	Y. M. 64 0	35.2	47.0	52.9	52.9	-	-	-	7.6	7.6	7.6	15.2	-	-
Totals	-	109	170	-	-	-	-	163	-	-	29.3	42.2	47.7	52.2	6.4	-	-	-	12.8	5.4	5.4	-	-
Averages	655	15.4	24.4	23.77	44	27	3.1	163	Y. M. 29 2	Y. M. 57 10	29.3	42.2	47.7	52.2	6.4	2.7	5.4	7.0	12.8	5.4	5.4	-	-



TABLE No. 6.  
PARISH of ST. MARY—RATES of MORTALITY.

YEAR.	Population.	Total number of Deaths.	Total number of Births.	Mortality to a thousand of the Population.	Proportion of Deaths to the Population.	Proportion of Births to the Population.	Proportion of Deaths of Infants under One Year to the Births.	Proportion of Deaths in public Institutions to the Population.	Proportion of Deaths from Zymotic Diseases to the Population.	Y. M. Average Age of all who have died.	Y. M. Average of all who have died above 20 Years.	Interval of Death to the total Deaths.											
												Under 1 Year.	Under 5 Years.	Under 15 Years.	Under 20 Years.	Between 20 and 30 Years.	Between 30 and 40 Years.	Between 40 and 50 Years.	Between 50 and 60 Years.	Between 60 and 70 Years.	Between 70 and 80 Years.	Between 80 and 90 Years.	90 and upwards.
1847	1,418	102	42	71.98	1 in 13	1 in 33	1 in 4	1 in 21	1 in 129	35 3	47 9	10.7	13.7	23.5	30.3	10.7	15.6	9.8	12.7	10.7	9.8	-	-
1848	1,481	91	45	61.44	1 in 16	1 in 33	1 in 6	1 in 24	1 in 164	37 0	46 9	7.7	12.0	19.7	24.1	16.4	14.2	12.0	10.9	13.1	7.7	1.1	-
1849	1,544	113	43	73.18	1 in 13	1 in 33	1 in 6	1 in 17	1 in 88	37 0	45 3	6.1	9.7	15.0	22.1	18.5	15.0	14.1	11.5	10.6	3.5	4.4	-
1850	1,607	81	41	50.40	1 in 20	1 in 32	1 in 20	1 in 24	1 in 160	41 3	48 0	2.4	3.7	11.1	17.2	11.1	11.6	16.0	9.8	12.3	9.8	3.7	-
1851	1,670	85	41	50.89	1 in 19	1 in 40	1 in 10	1 in 28	1 in 111	34 9	45 0	4.7	10.5	18.8	25.8	22.3	7.0	10.5	21.0	7.0	5.9	-	-
1852	1,734	77	43	44.40	1 in 22	1 in 21	1 in 7	1 in 30	1 in 144	37 3	51 9	8.0	13.0	19.4	29.8	10.4	9.1	11.7	16.8	11.7	9.1	1.3	-
1853	1,798	78	35	43.93	1 in 23	1 in 23	1 in 6	1 in 33	1 in 100	32 6	51 6	7.7	20.5	20.4	41.0	7.7	10.2	14.0	7.7	7.7	8.9	1.2	-
Totals	-	627	200	-	-	-	-	-	-	38 3	47 8	6.8	11.9	19.4	26.9	14.1	13.2	12.6	12.8	10.2	7.6	1.7	-
Averages	1,607	80.7	41.7	55.73	1 in 18	1 in 39	1 in 7	1 in 24	1 in 115	38 3	47 8	6.8	11.9	19.4	26.9	14.1	13.2	12.6	12.8	10.2	7.6	1.7	0.1

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TABLE No. 7.  
PARISH of ST. PAUL—RRATES of MMORTALITY.

Y <small>EAR</small> .	P <small>OPULATION</small> .	T <small>TOTAL</small> n <small>UMBER</small> of D <small>EA</small> T <small>H</small> S.	T <small>TOTAL</small> n <small>UMBER</small> of B <small>IR</small> T <small>H</small> S.	M <small>MORTALITY</small> to a t <small>HOUSAND</small> of the P <small>OPULATION</small> .	P <small>ROPORTION</small> of D <small>EA</small> T <small>H</small> S to the P <small>OPULATION</small> .	P <small>ROPORTION</small> of B <small>IR</small> T <small>H</small> S to the P <small>OPULATION</small> .	P <small>ROPORTION</small> of D <small>EA</small> T <small>H</small> S of I <small>NFANTS</small> under One Year to the B <small>IR</small> T <small>H</small> S.	P <small>ROPORTION</small> of D <small>EA</small> T <small>H</small> S from Z <small>YMO</small> T <small>IC</small> Disease to the P <small>OPULATION</small> .	A <small>VERAGE</small> A <small>GE</small> of all who have died.	A <small>VERAGE</small> A <small>GE</small> of all who have died above 20 Years.	P <small>ROPORTION</small> per C <small>ENT.</small> of D <small>EA</small> T <small>H</small> S at each I <small>NTERVAL</small> of D <small>EA</small> T <small>H</small> to the t <small>TOTAL</small> D <small>EA</small> T <small>H</small> S.												
											Under 1 Year.	Under 5 Years.	Under 15 Years.	Under 20 Years.	Between 20 and 30 Years.	Between 30 and 40 Years.	Between 40 and 50 Years.	Between 50 and 60 Years.	Between 60 and 70 Years.	Between 70 and 80 Years.	Between 80 and 90 Years.	90 and upwards.	
1847	6,337	160	199	23.48	1 in 32	1 in 7	1 in 108	24 9	54 6	18.1	40.0	55.6	58.8	4.3	8.0	4.0	9.3	4.3	8.7	3.1	-	-	
1848	6,467	142	190	21.96	34	4	184	18 9	55 0	31.6	54.9	65.6	67.6	2.1	4.2	7.0	3.5	4.9	8.5	4.9	-	-	
1849	6,547	165	209	25.35	31	6	109	32 3	54 3	18.1	30.6	41.5	44.5	6.0	6.0	12.6	9.6	7.2	9.6	4.8	-	-	
1850	6,625	112	201	16.89	32	6	245	26 0	54 0	24.1	48.2	51.7	55.3	8.0	8.0	-	6.3	11.6	8.0	9.7	-	-	
1851	6,709	91	205	13.56	32	8	335	26 3	55 0	25.2	39.5	47.2	53.8	6.6	8.8	2.2	5.5	9.9	8.8	2.2	2.2	2.2	2.2
1852	6,800	118	192	17.35	35	5	755	32 6	61 0	29.6	40.7	46.6	48.3	3.3	4.2	4.2	7.5	15.0	8.4	6.6	6.6	1.6	1.6
1853	6,892	129	210	18.71	32	5	188	24 6	52 3	28.6	47.2	54.2	55.8	6.2	10.1	4.6	3.9	7.8	5.4	6.2	6.2	-	-
T <small>TOTALS</small>	-	918	1,406	-	-	-	189	23 8	55 1	24.7	42.4	51.9	54.9	5.1	6.8	6.1	6.7	8.4	7.5	4.4	4.4	0.4	0.4
A <small>VERAGES</small>	6,628	131½	200½	19.78	33	5½	189	23 8	55 1	24.7	42.4	51.9	54.9	5.1	6.8	6.1	6.7	8.4	7.5	4.4	4.4	0.4	0.4

TABLE No. 8.  
PARISH OF ST. PETER—RATES OF MORTALITY.

YEAR.	Population.	Total number of Deaths.	Total number of Births.	Mortality to a thousand of the Population.	Proportion of Deaths to the Population.	Proportion of Births to the Population.	Proportion of Deaths of Infants under One Year to the Births.	Proportion of Deaths in public Institutions to the Population.	Proportion of Deaths from Zymotics to Population.	Average Age of all who have died		Proportion per Cent. of Deaths at each Interval of Death to the total Deaths.													
										Y. M.	Y. M.	Under 1 Year.	Under 5 Years.	Under 15 Years.	Under 20 Years.	Between 20 and 30 Years.	Between 30 and 40 Years.	Between 40 and 50 Years.	Between 50 and 60 Years.	Between 60 and 70 Years.	Between 70 and 80 Years.	Between 80 and 90 Years.	90 and upwards.		
1847	1,800	71	55	39.44	1 in 25	1 in 32	1 in 3	1 in 54	1 in 112	39 0	61 9	27.1	33.8	36.6	38.8	7.0	2.8	5.6	5.6	11.2	23.9	23.9	5.6	-	-
1848	1,809	50	56	26.83	1 in 37	1 in 33	1 in 4	1 in 63	1 in 189	32 6	59 3	26.0	44.0	46.0	48.0	8.0	6.0	4.0	8.0	12.0	14.0	-	-	-	-
1849	1,999	51	58	25.51	1 in 39	1 in 34	1 in 5	1 in 79	1 in 309	31 0	44 0	23.5	25.4	29.4	29.4	3.9	3.9	5.8	5.8	7.8	27.6	11.7	3.9	-	-
1850	2,099	54	69	25.82	1 in 38	1 in 34	1 in 8	1 in 75	1 in 1049	46 6	64 9	14.8	25.9	27.7	29.6	5.5	1.8	11.0	1.8	11.0	22.0	14.8	1.8	-	-
1851	2,198	58	64	26.39	1 in 38	1 in 31	1 in 7	1 in 91	1 in 314	40 6	56 0	15.5	29.3	32.7	32.7	6.9	10.3	8.6	5.2	8.6	10.3	17.2	-	-	-
1852	2,378	49	65	20.60	1 in 48	1 in 36	1 in 8	1 in 99	1 in 1,689	42 0	57 6	16.3	22.4	26.5	28.6	13.8	4.0	4.0	-	10.2	24.4	10.2	-	-	-
1853	2,560	51	59	23.05	1 in 50	1 in 43	1 in 5	1 in 116	1 in 365	38 6	61 9	21.5	31.3	37.5	41.1	3.9	3.9	1.9	7.8	15.6	15.6	7.8	1.9	-	-
Totals	-	384	426	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Averages	2,099	54.7	60.7	25.72	1 in 38	1 in 35	1 in 5.4	1 in 80	1 in 299	38 9	59 0	19.7	30.4	33.8	35.4	7.5	4.6	6.0	4.9	10.9	19.8	9.8	1.0	-	-

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TABLE No. 9.  
COMPARATIVE RATES OF MORTALITY IN THE BOROUGH.

YEAR.	Population.	Total number of Deaths.	Total number of Births.	Mortality to a thousand of the Population.	Proportion of Deaths to the Population.	Proportion of Births to the Population.	Proportion of Deaths of Infants under One Year to the Births.	Proportion of Deaths in public Institutions to the Population.	Proportion of Deaths from Zymotic Diseases to the Population.	Average Age of all who have died.		Proportion per Cent. of Deaths at each Interval of Death to the total Deaths.													
										Y. M.	Y. M.	Under 1 Year.	Under 5 Years.	Under 15 Years.	Under 20 Years.	Between 20 and 30 Years.	Between 30 and 40 Years.	Between 40 and 50 Years.	Between 50 and 60 Years.	Between 60 and 70 Years.	Between 70 and 80 Years.	Between 80 and 90 Years.	90 Years and upwards.		
	1,003,124	16,062	28,280	16.01	62½	35	11	—	449	1 in 1	37 5	60 0	16.0	27.5	34.4	38.4	7.8	5.9	5.6	6.8	10.0	13.8	10.0	10.0	2.0
1847 -	10,659	359	345	33.38	29	30	4	108	110	1 in 1	23 10	53 8	16.7	30.6	42.0	46.5	6.9	8.6	5.8	9.1	8.3	11.7	11.7	8.8	0
1848 -	10,939	311	332	28.43	35	32	4	118	176	1 in 1	26 9	51 9	23.7	40.1	47.5	50.8	7.3	8.0	8.0	6.4	8.6	6.7	6.7	2.8	0
1849 -	11,189	352	346	31.45	31	32	6	96	117	1 in 1	34 5	49 3	15.6	24.1	32.1	35.7	9.9	11.6	9.3	9.3	9.0	9.9	5.9	6.2	0
1850 -	11,441	272	346	23.77	42	33	7	121	238	1 in 1	38 4	52 9	16.1	29.4	34.5	38.9	9.2	7.9	7.9	7.6	11.0	10.7	6.2	4.7	0
1851 -	11,698	254	348	21.72	46	33	8	127	254	1 in 1	32 6	52 5	16.5	27.5	34.6	39.7	11.4	7.8	6.7	10.6	9.4	8.6	4.7	4.7	0
1852 -	12,037	267	345	22.18	45	34	6	154	445	1 in 1	40 6	57 8	19.8	28.0	33.3	37.8	8.6	5.5	6.0	8.3	13.4	12.0	5.8	5.8	0
1853 -	12,354	280	337	22.60	44	36	5	165	190	1 in 1	29 6	54 8	21.8	37.1	44.2	49.2	5.7	6.7	6.7	8.3	9.2	8.1	5.4	5.4	0
Totals -	-	2,095	2,399	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Averages -	11,441	299½	342½	26.15	38	33	6	125	184	1 in 1	31 1	53 0	18.5	30.9	38.5	42.2	8.4	7.6	7.6	8.1	9.7	9.7	4.7	4.7	0



I shall make a few observations, as brief as possible, upon BEDFORD. these Tables.

Table No. 4 has reference to the parish of *St. Cuthbert*, in which there are no public institutions capable of swelling the mortality; but on the other hand, it may be fairly assumed that persons from that parish go into the work-house, infirmary, fever hospital, &c, and tend to increase the mortality of those institutions. Still the mortality of *St. Cuthbert's* parish, considered alone, is very excessive.

Table No. 5, *St. John's* parish, is also without public institutions, but the population dies prematurely, and every individual loses about 10 years of life.

*St. Mary's* parish (Table No. 6) contains the infirmary and lunatic asylum, and, taken separately, there cannot be a doubt of the broad fact that its mortality is largely aggravated by the deaths in those institutions; but it should be remembered that the inmates constitute one-fourth of the population of the parish, and that they are brought in a state of disease from the other parishes of the borough, as well as from the surrounding country.

The parish of *St. Paul* (Table No. 7) contains the gaol, but the inmates of that institution are found to be more healthy than the inhabitants of the parish in which they are situate. The rates of mortality in *St. Paul's* parish are very high, especially from zymotic diseases, without any aggravation by public institutions.

The parish of *St. Peter* (Table No. 8) contains the union workhouse, in which many of the deaths are those of aged people. The mortality per thousand is high, but the inhabitants attain to considerable age, and a large proportion of them belong to the five parishes forming the borough of Bedford.

Coming to Table No. 9, which includes the whole borough, I am anxious first to dispose of the influence of these public institutions upon the mortality. By reference to the report of the committee of the town council, and the evidence of Messrs. Smith and Carling thereon, and also to the depositions of Mr. Samuel Rolls and Mr. William Bettle, it will be seen that two errors have been committed, fatal to all the calculations and conclusions of those gentlemen.

1st. They have assumed that none of the 850 inmates of the public institutions of the town had any connexion with Bedford, and in pursuance of this have deducted all the deaths in such institutions from the mortality of the borough. Such deaths are more than 80 per annum, and a considerable proportion were those of inhabitants of the borough.

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2d. In comparing the gross mortality of Bedford with that of other towns, they have assumed that such public institutions are *peculiar* to Bedford, and have not considered that all towns of the importance of Bedford have their own public institutions, and that the accommodation in such institutions is proportionate to the population of the town and district. In this respect Bedford is favourably circumstanced, inasmuch as it is not liable to those accidents which increase the inmates of infirmaries, hospitals, and workhouses in manufacturing and mining districts.

The laws of life have not yet been sufficiently simplified to admit of any absolute standard of human existence attainable by human efforts and precautions, and therefore all vital statistics must be comparative. The conclusions from such comparisons can only be of value when there is a sufficient degree of similarity between the circumstances of the places compared, and with this view I have laid down the broad basis in the first line of Table No. 9, which contains more than 60 union workhouses, with a proportionate number of infirmaries, hospitals, and other public institutions.

Excluding any comparison with other places, there can be no doubt that the public institutions of Bedford increase the mortality of the borough; but the extent of this increase has been carefully and fairly eliminated by Dr. Barker in Tables IX., X., and XI. of his Report on the Mortality of Bedford. He has excluded the deaths in the public institutions of *persons not belonging to Bedford*, and I regret to say that the calculation still leaves the mortality of the remainder of the borough nearly 23 to a thousand on the average of a series of years.

This is the point of excessive mortality at which (without excluding public institutions) the legislature authorized proceedings under the Public Health Act, in the absence of any petition for its application.

If space permitted, I would make some observations on the averages at the foot of each of the Tables 4 to 8, as compared with the first line of Table No. 9. I recommend such comparison to the earnest attention of the Board and the inhabitants of Bedford, and confine my remarks briefly to the first and last lines of Table No. 9.

The first column to which I would draw attention is that showing the mortality to a thousand of the population. In the 61 registration districts it is 16 to a thousand, but in the borough of Bedford 26.15 per thousand as the average

of seven years.\* This is equivalent to the destruction of BEDFORD. 116 human lives per annum, or 812 for the seven years included in the Table.

A low sanitary condition is always indicated by an excess in the number of births; and it will still further be seen that the deaths of infants under a year old cannot be affected by the public institutions of the town. The test of infantile mortality is considered one of the most infallible, because infants are strictly under the influence of home, and are not affected by occupation, accident, or sensuality. In the sixty-one registration districts it appears that out of every eleven children born one dies under a year old, while in Bedford one dies out of every six born. The proportion is nearly double.

I have been unable to ascertain the deaths in the public institutions of the registration districts at the head of the Table. I presume that it has not appeared right to separate them from the general mortality.

The next column, showing the proportion of deaths from zymotic diseases, is one of serious import to Bedford. In the sixty-one districts such deaths are 1 in 449 of the population annually, but in Bedford the proportion for each of the last seven years is 1 in 184. This is equivalent to an average excess of 38 deaths from fevers, &c., in Bedford every year. In the year and a half ending April 1854 there had only been 12 deaths in the fever hospital of persons not belonging to the town.

Another comparison I think it necessary to make is as to the next two columns of the Table. It will be seen that in the sixty-one districts, containing more than a million of inhabitants, the average age at death of all born is 37 years and 5 months; while in the borough of Bedford it is only 31 years and 1 month. This is an average loss of six years and four months of life to each individual. So of those who have died above 20 years old (thus excluding all children), in the former case it is 60 years, but at Bedford only 53 years.

#### SEWERAGE, DRAINAGE, &C.

I have already referred to the statements of several of the medical witnesses as to the injury to the general drainage of the district caused by the obstructions placed across the river Ouse at Bedford. I shall therefore confine myself to a general reference to the minutes of my

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\* In the return from the Registrar-General (*ante*) it will be seen that the proportion is 23 to 1,000; but he has not taken the same seven years.—W.L.

BEDFORD. inspection, and the abstraction of the most important parts of the evidence taken at the inquiry.

Mr. *James Woodroffe* is the surveyor to the Improvement Commissioners, and made a report on the public drainage of the town. He describes the sewerage of the parishes separately.

In *St. Cuthbert's Parish* there appear to be two lines of sewer, 14-inch barrel drains, from seven to five feet deep, emptying into the river at Old Ford. He says the drains from Newnham-street are not sufficiently deep to drain the houses, and cesspools are formed for the purpose. Several drains empty into open watercourses, and he says "the filth is exposed and offensive." Thames-street has no sewers or drains.

*St. Peter's Parish.*—Some houses have 18-inch barrel drains, seven feet deep, into a sewer belonging to the House of Industry. It terminates in a cesspool on the side of the Goldington-road. There is an 18-inch barrel drain from St. Peter's High-street to St. Peter's Green, averaging six feet deep, but the branch drains into it are very imperfect. It empties into the gaol sewer.

*St. Paul's Parish.*—The upper part of the sewer in Well-street is level with the road, which prevents any house drainage. It is continued to Batt's Ford, and causes "large quantities of mud and filth to collect, and at low water the smell is very offensive." In High-street the public drain is very defective, and not sufficiently low to receive branch drains more than three feet deep. He says "a considerable part of this principal street is without any drain." In the north-west part of the parish, he says, there are some thousand yards of drain not more than 18 inches below the surface.

*St. Mary's and St. John's Parishes.*—In part of High-street there is a barrel drain, but only from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  feet below the surface of the ground. The branch drains leading into it are very defective. "The open water-course at King's Ditch is at times very offensive, caused by the drainage of various privies into the same."

In answer to an inquiry by me, Mr. *Woodroffe* said,—

"I would name a cesspool in St. Mary's parish, the house of the late Dr. Yates; that cesspool I found to be formed of dry stones, and apertures between, similar to a colander, so that it had drained under the walls, and under the house, and under a house opposite. I should say that, in 19 cases out of 20 having cesspools, they are made to act as colanders, and to drain into the earth."

Such is the description given of the public drainage of BEDFORD. the county town of Bedford by the public officer who has charge of the same.

I would next direct attention to the evidence of *R. B. McCumming*, Esq., whose house is at times scarcely habitable, in consequence of the stench from a cesspool belonging to the Moravian establishment. He has had much inconvenience from the cesspool on his own premises, and reason to believe that it has polluted the water-well. There has been typhus fever in the Moravian School.

*Mr. James Howard* is in a large business as an iron-founder and implement maker. He wished to drain the house connected with the premises in St. Paul's parish; and, to get rid of the stench, he offered to pay half the expense of a sewer in that part of High-street, but his offer was rejected. The evil still remains, because there is no outlet. He says the stench in the night is most offensive. His brother afterwards had typhus fever in the same house, and was ill three or four months. *Mr. Howard* has a house in St. John's parish, where the water and drainage were in a filthy state. Last winter from 20 to 30 pailfuls of black filthy matter were taken from the bottom of the water-well, and a great uncemented cesspool was found within a few feet distance of it. He had a severe illness of many weeks' duration, and his medical attendant attributed it to that cause. He has some business premises in Gravel-lane, and the stench from the drainage is such that he cannot remain many moments in a shop adjoining.

*Mr. James Horsford* is an architect and builder in Bedford. He presented a valuable report on the water-supply, drainage, &c., to which I can scarcely do more than refer the Board. He has erected about 300 houses in the town, and is the owner of considerable property. As to the public sewerage, he fully confirms the statements of *Mr. Woodroffe*. In some cases the sewers drain *into* the cellars for want of sufficient depth, and the sewage has to be pumped out. He speaks of such house-drains as exist, in a great part of the town, as follows:—"They are in a wretched condition, badly constructed, with scarcely any fall; and however the landlords might be disposed to improve the drainage, I believe it impossible to do any good until there is a proper main sewer constructed." He says very few cesspools are cemented, although they receive the excrementitious matter from privies and waterclosets. In some cases there are two cesspools to each house, and he has had practical experience that the matter percolates to the water-

**BEDFORD.** wells. He also calls attention to the evil of pouring sewage into the open ditches, of which there are several in the town.

Mr. *John Usher* is an architect and surveyor, practising in the town. He had taken much pains in the preparation of a report which will be found appended hereto. I can only in this place advert to a few of the most striking points which it presents. He says the town stands on 52½ acres of land, and the houses are about 2500 in number. The sewage discharged itself by *seven* independent outlets. He considers the defective sewerage of the town the root of its sanitary evils, and that the sewers are objectionable in shape, size, depth, and falls. The Local Act prohibits the discharge of waterclosets into them. The general receptacle of fecal matter is the cesspool, and the more freely it will percolate the filth into the subsoil (*i.e.* the water-bearing stratum) the more perfect the cesspool is considered. If the process should be continued, he looks forward to an inoculation of the whole site of the town with pestiferous matter. He refers to the open ditches in similar terms of reprobation to those used by Mr. Horsford. As to private drainage, some of the first-class houses are tolerably drained, but "the most thickly populated districts are very deficient, and many of the yards and courts have no drains what-ever." Such house drains as do exist are generally defective in character and construction.

*James Wyatt, Esq.*, is the proprietor of the *Bedford Times* newspaper, and has been long labouring to bring about the sanitary improvement of the town. He very properly attributes the cesspool system to the deficiency of drainage and sewerage. He says there are above 3,000 cesspools in the town, and that, as a natural consequence, a large portion of the soil is saturated, and many of the wells polluted. He illustrates this by his own experience. A servant left in charge of his house was seized with illness; he found that the water was thick and filmy, and on opening the well a cesspool was found to have leaked, and the filth had been passing into the well for some time. He removed the cesspool, and had a new well sunk down to the limestone rock. At first the water was good, but in a few months it became so bad that a thorough examination was necessary, and it was then found that the new well received the soakage from a yard at 120 feet distance, where a person kept pigs, and accumulated large quantities of manure which he collected from privies, &c. As to the existing public sewerage of the town, Mr. Wyatt corroborates the condemnation of the preceding witnesses, and

especially refers to the increasing accumulations of filth in the river from the deposits of the sewers. He says, "It is not an uncommon thing in Bedford for wells to be opened and cleaned out. Great quantities of foul matter are removed, not an atom of which would come in a natural way, but which is entirely due to the soakage of cesspools and to deficient drains."

#### WATER SUPPLY.

With a porous soil like that of Bedford, and a system of percolating cesspools for drainage, and with water-wells sunk into the same stratum to supply the inhabitants of the town with one of the first necessities of life, there has become established so frequent a connexion between the cesspool drain and the water-well, that in bringing before the Board the facts connected with the drainage of the town, I have unavoidably stated sufficient to utterly condemn the present mode of obtaining water.

There are no public waterworks in Bedford. There may possibly be other county towns destitute of such works, but I know of none, and should be disposed to doubt whether there is another town in England of equal wealth and importance, that has taken no steps to remedy so great a defect in its municipal, social, and sanitary condition.

I shall condense as much as possible the statements which I feel it my duty to lay before the Board. As in the other topics of my report, the evidence in full will be appended for more detailed information. The minutes of my inspection, also, are full of instances of houses without any water, privies and cesspools close to wells, water in every stage of pollution, from comparative purity, in recent instances, to highly concentrated liquid sewage, and even to the abandonment of further use for slopping and cleansing. As stated by Mr. Usher in his evidence, the pollution of the subsoil of the town is an accumulative process, and it is only a question of time when the drawing from the wells shall have facilitated the percolation of the cesspools to such an extent that the whole site of the town would become a pestiferous dungstead, and water fit for domestic purposes cease to exist.

Most of the medical witnesses have referred in strong terms to the fact that the water supply is bad, and the wells extensively polluted. The same fact is admitted in the remarkable testimony of Messrs. Smith and Carling, and even in the more remarkable statements of Mr. William Bettle, and it cannot be denied by any one who will give the slightest attention to the subject.

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Mr. *Horsford* says in his report, already referred to,—

“On the west side of the town the wells are about 9 feet deep, and at that depth we come to gravel and plenty of water. *These wells rise and fall according to the height of the river*, which makes this part of the town very damp. Other wells vary from 9 feet to 30 feet deep, and even in some of these the water is bad. It is said Bedford is well supplied with water. I admit there is plenty of water, but is it pure? I fear that *most* of our wells are more or less polluted, by the soil being impregnated with the liquid from these cesspools.”

As a natural consequence of what is stated above, any improvement of the river course by lowering the head of water at the mills would also lower the water level in the sub-soil of the town, and dry the shallow wells. The site of the town would be less damp, and it would really be a boon to the inhabitants if they were deprived of much of the water they are now compelled to drink.

Mr. *Usher* says in his report,—

“In nearly all the parishes there are many houses without any proper supply; and in the parish of St. Cuthbert there are 25 houses, the inmates of which represent a population of 125 souls, who have no other resource than a back stream of the river, into which all the drainage flows, and on the surface of which the putrid carcasses of dead animals may frequently be seen.”

Mr. *Wyatt* says,—

“I take opportunities of examining wells for geological information, and I have never seen a new well, that I know of, that the water has not been good in the first instance. I have seen wells opened afterwards, and the water has been of a quite different character. Those were the same wells that I had previously seen to have good water.”

In consequence of the statements in evidence, I directed Mr. Stennett, inspector of nuisances, to make an examination of the courts and alleys, &c. of the town, so that I might know in detail the state of the cottages as to their water supply. His return in a tabular form will be found in the appendix. It includes 700 houses, supplied by 60 pump wells, and 10 draw wells. Of the total number of 70 wells, 29 are found to be unfit for use, and many others more or less polluted. A most striking fact is evident from this return, viz., that there is generally a less distance from the privy to the well than there is from the houses to the well.

There are said to be six public pumps in the town, and water is fetched from them to great distances by persons who are either entirely destitute of water, or cannot use the polluted water in their wells.



In *Dame Alice Street* there are 65 almshouses, occupied BEDFORD. by very aged persons, as shown in the evidence of Mr. Samuel Rolls. They are all from 60 to 90 years of age, and are supplied with water from *four* pumps in the street. The whole of the water consumed by these old people has to be fetched and carried in all states of the weather, and at all seasons of the year. During my inspection I saw some of them so occupied.

#### CONDITION OF DWELLING-HOUSES AND APPURTENANCES.

The constructive character of many of the houses is such as to aggravate the consequences of other sanitary defects. The local Acts of Parliament contain no proper building regulations, and there are many houses in Bedford that could not be effectually reached by the Public Health Act. They are unfit for human habitation, and some of them ought to be destroyed or closed up.

Among the more common constructive defects of houses, aggravated by other evils, are the want of ventilation and deficient breathing space. I beg to cite one or two instances from the minutes of my inspection.

Near *Water-lane* Mr. Pestell has eight houses. They have no water whatever, nor any drainage. There is an open filth hole for the privies. The wooden floor of the privy was broken, and the night soil was level with it.

*There are no back doors to any of the houses.* The cholera is said to have always commenced in this neighbourhood.

*Gravel-lane* is mentioned in the evidence of Mr. Blower, surgeon, and also by Mr. Howard. Eighteen houses here belonged to the late Mr. Palgrave, who was mayor of Bedford. Seven of the houses had cholera in 1849, and I was told that 17 or 18 persons died in the row. The houses are back to back, without any ventilation. The pump is against a privy, and within six feet of the same pump are three privies and a dung hole. The well is eight or nine feet only from the pump.

*Paradine-court*, in Harpur-street, is a disease locality. There is a well and pump not used, and on my asking the reason why, a woman said, "The pump has gone out of use because they dug the dung into the well, and spoiled the water." Three cottages in this court are surrounded with buildings, so that no free air can reach them. There is only a narrow covered passage to them. They have no ventilation, no drainage, and no water. The floors are below the level of the court; the front walls are only *about*

BEDFORD. 8 feet high, and out of perpendicular, and yet these houses consist of *three stories*. There ought to be some legal power to condemn such houses as unfit for human habitation.

In the next court-yard visited a man had a heap of earth upon the floor of his living room, to soak up the ordure that drained through the wall from a privy cesspool.

In *Queen-street* I examined some new houses in course of erection, and not yet completed. The houses were the best kind of double cottages, and I found a cesspool being formed for two privies. Its walls were only half brick thick, laid in common mortar, and without any bottom but the earth into which it is to soak. The bottom of the cesspool was about two feet below the surface of the ground, and at only 12 feet distance was the water-well, 12 to 14 feet deep. It cannot be otherwise than that the night soil will pass into the well, but no one has authority to interfere.

Mr. *Usher* says in his report,—

“Whilst the better class houses have been restored, and in some instances rebuilt, we find the labouring classes are obliged to live in houses almost always dilapidated, ill-ventilated, insufficient, and unhealthy. These habitations exist chiefly in the old town, and many of them are ruined and filthy. They are small, and as parents and children frequently sleep in the same apartment, the overcrowding is both a cause of unhealthiness and an offence against good morals.”

I conclude this part of my report with an extract from the valuable paper put in by Mr. *Rowland Hill*, the proprietor of the *Bedford Mercury* newspaper:—

“Houses have been noticed built back to back, without the possibility of ventilation—repositories of foul air, in which the inmates daily and nightly breathe and imbibe through every pore a dangerous poison. Many dwellings have no privies; others have closely-contiguous open cesspools, into which excrement and all sorts of indescribable filth lie bubbling, steaming, and exhaling gases that charge the atmosphere with disease. Some houses have no supply of water, whilst whole streets of dwellings have no drains, or drains surcharged and jammed with filth.”

#### ROADS AND SURFACE CLEANSING.

The public streets of Bedford are kept in an efficient state of cleansing and repair; but there are many streets that have never yet been dedicated to the public, and these are unpaved, never cleansed, and some of them almost impassable in winter. Scarcely any of the courts in which the poor live have any pavement. Mr. *Woodroffe*, the

surveyor to the commissioners, put in a brief report on the extent and cost of the public roads, and I have appended it. It seems that the highways repaired by the commissioners are about  $11\frac{1}{4}$  miles in length, and the pathways and gutters about 19 miles. In addition to the above there are  $4\frac{1}{4}$  miles of turnpike road in the borough repaired by their respective trustees. The average expense of repairing the roads is 488*l.* per annum. The "watering, sweeping, and collecting and removing dirt, and earriage of 2,000 yards of gravel," costs the sum of 418*l.* per annum.

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Mr. *Usher* says in his report,—

"There are 16,000 yards lineal of streets; 24,000 yards of footpaths; 1,780 yards of paving, dilapidated; 10,588 yards of drains and sewers, varying, with one exception, from 6 inches to 18 inches diameter; and 411 public traps or drain eyes. Eighty-two of these are patent traps, but they are very offensive, owing to a deficiency of water to cleanse them."

I shall have to notice herein-after a legal difficulty in the matter of rating for the repair of the highways.

#### STATE OF THE BURIAL GROUNDS.

There are no less than eleven burial grounds in Bedford, all of which I examined in pursuance of my duty.

*St. Mary's Churchyard* has been used for centuries, and the surface is strewed with fragments of human bones. The incumbent says the ground is so full that two children who had only been interred two years had to be taken up to make room for the mother.

Mr. *Wyatt* has given, in his report, some valuable information respecting the burial-grounds, collected by him with a view to the establishment of a general cemetery.

Of *St. Mary's* he says that the ground has been lately contracted by the enlargement of the church. The area is only 28 perches.

*St. John's Churchyard* is very small, as is the population of the parish. There are only a few interments annually, but the ground has been used from ancient times, and must have become little else than the dust of decayed humanity.

*St. Paul's Churchyard* is much larger, being almost an acre, but it is in an equally crowded state, and with the further disadvantage of being surrounded on every side with buildings. According to Mr. *Wyatt's* report, there have been 3,532 bodies interred in it during the last 50 years.

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*St. Peter's Churchyard* is also quite unfit for interments. The area is three roods. In summer the odour from it is said to be offensive to passers-by.

*St. Cuthbert's Churchyard* contains only 1 rood and 16 perches. It has been raised several feet above the road on the south and west sides, but is kept in as neat a condition as possible. There have been 295 interments in it within the last 21 years.

*Trinity Church* was only erected about 15 years since, and has not yet become filled. It is not in a densely-populated neighbourhood.

The *Moravian Burial-ground* contains 2 roods and 3 perches. There have been 115 interments since 1830. The ground is kept in good order; and there is a uniformity in the simple gravestones that seems to say, solemnly, "all are equal here."

*Bunyan Chapel Burial-ground*.—The chapel was rebuilt in 1850, and the whole ground was then raised several feet and levelled. Being now overgrown with grass, a stranger would not suppose that it had been used for two centuries or more, and that from 1829 to 1853 there had been 483 interments in an area of about 35 perches of ground. Mr. Wyatt says, in his report, "the area will soon probably be covered with another layer of bodies, unless measures be taken to induce or compel the members of the chapel to avail themselves of the cemetery."

*Howard Chapel Burial-ground* is of small area, and appears to be full, with the exception of a small plot of new ground behind.

*Baptist Chapel Burial-ground* is surrounded by buildings, and is approached through a narrow passage between houses. The area is little more than 200 square yards, and appears to have been all used for interments. There is a pump in the burial-ground, and I was informed that a family uses the water for drinking and general domestic purposes.

*Wesleyan Chapel*. A small plot of ground, about 150 square yards, has been used for a few interments, but it has no appearance of being intended as a public burial-ground.

With respect to the burial-grounds generally, Mr. Wyatt says,—

"I would urge the immediate closing of all of them,—first, on account of their crowded condition, and secondly, because a general cemetery is now provided under the Burial Acts 15 & 16 and 16 & 17 Victoria. Ten years ago I called public attention

to them, but the difficulties in the way of obtaining a joint BEDFORD. cemetery, under the then deficient state of the law, were considered insuperable; but there is no justification for the perpetuation of these painful desecrations now that a cemetery has been provided for four of the parishes."

The cemetery referred to is on rising ground, at a sufficient distance from the town, and is quite free from all objections on sanitary grounds.

#### LOCAL ACTS OF PARLIAMENT AND JURISDICTION.

There are two Local Acts of Parliament for the improvement of the town of Bedford: 43 Geo. 3. c. 128. is an Act for that purpose, "and for rebuilding the bridge over the River Ouse in the said town."

50 Geo. 3. c. 82. is an Act to enlarge and amend the powers of the above Act.

It will have been seen already, from the evidence of several of the witnesses on the subject of drainage, that these Acts prohibit the turning of any watercloset into any sewer. In addition to that, these Acts protect, by the absence of powers to compel removal, the assumed rights of owners and occupiers to retain dung and filth upon any private premises. I have adverted only to these two points at present, for the purpose of showing that these Acts of Parliament were framed with little practical reference to sanitary considerations.

Mr. *William White*, who was for years an Improvement Commissioner, says in his evidence, —

"I have been long convinced that much was necessary to be done that the commissioners had no power to do; and that, if they had power, they had no funds for such purposes."

The evidence of *Samuel Wing*, Esq., is very important, because he is not only acquainted with the existing legal powers, but also with the actual requirements of the locality. He first narrates the proceedings of the guardians during the epidemic of cholera in 1849, and then puts in an extract from their report, after its subsidence, stating their conviction that neither the Nuisances Removal Act nor the Local Improvement Acts are at all adequate to meet such an evil. A similar conviction was entertained when they were called upon to act again in 1853. In the latter part of his evidence Mr. Wing refers to the peculiar circumstances under which the borough is placed with regard to the highways. Before the passing of the Local Acts, all the land, in each of the five several parishes comprising the borough, had been liable from time immemorial to the

BEDFORD. reparation of the highways. The Local Acts, being intended for the improvement of the Town only, excluded the lands within the borough from the rates which the commissioners were authorized to levy. By section 37, the commissioners were invested with all the powers, &c., given by the old Highway Act (13 Geo. 3, c. 78), and the surveyor of the commissioners has all the power of collecting the rates, &c., as were given to surveyors appointed thereby; and for many years the commissioners exercised the powers under this Act, and levied highway rates, but after the passing of the existing Highway Act (5 & 6 Wm. 4, c. 50), which exempts from its operation all roads repaired under Local Acts, and the consequent abolition of statute duty, an attempt was made by the commissioners to levy a highway rate under the old Act, which having been disputed, the question was argued in the Court of Exchequer in 1842, when it was held that the 37th section of the Local Act did not confer upon the surveyor the power of making a rate in aid of that granted by the 50th section of the same Act, and that the power above mentioned was conferred by the 37th section, merely to enable the commissioners to collect and receive all claims due to the old surveyors of the five parishes, upon their being abolished. The consequence is, that the lands, including the garden ground within the borough, are relieved from the charges of maintaining the highways, and the burdens of the other classes of property in the town greatly increased. A report of the case will be found among my papers. It is a case of great hardship, but appears to be irremediable under the Public Health Act, inasmuch as the last proviso of the 88th section seems to be conclusive.

Mr. Wing then refers to many other defects in the Local Acts, and suggests remedies. I fully agree with him when he says that "such parts of the Towns Improvements Acts, "the Markets and Fairs clauses Acts, &c. &c. and the "General Highway Act, as are applicable to the town of "Bedford should be incorporated in any measure for the "improvement of Bedford, so as to form a code of law for "the local government of the town." He considers that the payment of the old debt should be provided for; and that certain lands formerly in the possession of the surveyors of highways, but now without a clear title should be declared vested in the local authority.

Another matter requiring special enactment is the making provision for repairing the fabric of the bridge. By the first Local Act, the common law liability of repairing the bridge is abrogated, and it is provided that the commissioners shall for ever afterwards keep it in repair.

The toll-gate was removeable (and was removed,) when the BEDFORD. debt on the bridge was discharged, without any fund having been accumulated to meet contingencies, except the value of the site of the toll-house (about 400*l.*); therefore, in the case of any material damage to the bridge there would be no funds from which it could be repaired; and the re-erection of the toll-gate would be very undesirable. -

I now come to the last witness to whom I shall have to refer. *Thomas Wesley Turnley*, Esq. is a solicitor, and clerk to the Improvement Commissioners under these Local Acts of Parliament. His statement commences with a very clear abstract of the sanitary powers of the commissioners. They have only power to levy rates amounting in the whole to one shilling in the pound per annum; and the rates will realise about 1,400*l.* Out of that sum they have to pay nearly 600*l.* for interest, gas, rents, and salaries; leaving only about 800*l.* per annum for paving, cleansing, draining, watering, and repairing the roads. The debts and liabilities of the commissioners at present amount to about 6,500*l.*

Mr. Turnley then draws attention to the legal difficulties respecting the highways, and rating for their repair; and also to the proviso in the 88th section of the Public Health Act.

In answer to my questions he said,—

“I think that the powers of these Acts are not at all adequate for the purposes of town improvement, considered with reference to what is now known as to the laws of public health. Considered with reference to the general good of the town I must certainly reply that the rating powers are not sufficient. The assessment of land not being provided for in the Local Acts, I would direct your attention to the last proviso of the 88th section of the Public Health Act, and would state that some special enactment would be needed if the Act were to be applied to Bedford, in order to remedy the evil produced by the repeal of the Old Highway Act; and also that the lands may be, as in other districts, liable to the general district rates.”

There are other reasons why special enactments, beyond the provisions of the Public Health Act, are necessary for the improvement of Bedford.

I have already mentioned the reparation and maintenance of the fabric of the bridge.

The facts stated under the head “Condition of Houses,” shows that it is necessary to have the power (invested in justices after hearing), to condemn houses unfit for human habitation. It would be highly desirable that at the same time more extensive powers than those in the 53d section

**BEDFORD.** of the Public Health Act should be obtained for regulating the character of buildings.

The rights of two mills would require to be interfered with before the subsoil of the town could be drained, even to the depth of an ordinary cellar. One of these mills is entirely out of the borough, and therefore special powers will be required.

The river Ouse ceases to be within the borough at a very short distance below the bridge; and the outfall sewer—at least, on the north side of the river—would have to be constructed, probably to a great extent, through private land not within the jurisdiction of the Local Board. The drainage could certainly not be poured into the river within the borough. On this account special powers would be needed, with previous plans, and the property to be affected would require to be scheduled.

In no place are waterworks more needed than in Bedford; but as all the deep spring-water is excessively hard, there appears no other source so favourable as the river. The river is used for navigable purposes and by mills; and as the water would have to be taken out *above*, but returned to the river *below* the mills and a lock, the 145th section of the Public Health Act would prevent any such works, unless constructed under the authority of a special Act of Parliament. By means of such an Act, also, the sites of filters, engines, service reservoir, pipe tracks, &c. &c., could be obtained, without the Local Board being compelled (as is too often the case) to pay whatever sum may be demanded in consequence of their having no compulsory powers.

For these reasons I am of opinion that all the powers that may be desirable for the good government and sanitary improvement of the borough of Bedford should be embodied in one bill to be brought into Parliament, and that the Public Health Act should be incorporated with such Bill.

I am able to say that the two legal gentlemen, whose testimony under this head I have quoted, fully agree with the conclusion to which I have come.

I have also been informed that a complete measure of that kind would be more satisfactory to the Town Council and the inhabitants generally.

#### CONCLUSIONS.

I now bring this report to a termination by briefly recapitulating the conclusions under its various heads.

I. That the population of Bedford is about 12,000, and the houses about 2,500; that there are no injurious trades



r manufactures ; that the climate is good ; that there are munificent provisions for the benefit of the poor and the aged ; and that Bedford ought to be, as it is naturally, a very healthy town.

II. That the river course is obstructed ; the town drainage exceedingly defective ; that house drainage can scarcely be said to exist ; that there are more than 3,000 cesspools in the town ; that the water-wells are extensively polluted by such cesspools ; and that the constructive character of many of the cottages is incompatible with the health of the inmates.

III. That there is a great amount of sickness and mortality in Bedford, as proved by the testimony of the medical witnesses ; that much of such sickness and mortality is in excess, as proved by vital and comparative statistics ; that such excess is apparent in the proportion of deaths to the living, in the proportions of deaths of infants, in the deaths from zymotic diseases, and in the average loss of life to all the inhabitants.

IV. That absolutely, and irrespective of all other considerations, the deaths in the public institutions increase the rates of mortality in the borough ; but that many of such deaths are those of inhabitants of the town ; that the mortality is excessive in the parishes that do not contain public institutions ; and that the excessive mortality in Bedford is most strikingly developed where public institutions are inoperative, viz., in the proportion of deaths of infants under a year old to births, one of the most infallible tests of the sanitary condition of any community.

V. That the burial-grounds in the borough ought to be closed, especially as a new and sufficient cemetery has been provided.

VI. That Bedford is within the natural drainage area of the river Ouse, and that the borough consists of the whole of the five parishes of St. Mary, St. John, St. Paul, St. Peter, and St. Cuthbert.

VII. That sanitary improvements are greatly needed in Bedford ; that such improvements would save many human lives annually, would raise the general health of the town to a comparatively high standard, avert the susceptibility to zymotic disease, and be productive of great economy.

VIII. That the local Acts of Parliament are so defective that the commissioners are unable to improve the sanitary

BEDFORD. condition of the town; that many of such defects could not be remedied by the application of the Public Health Act *alone*; that a comprehensive measure is needed for the good government and sanitary improvement of the town and that the Public Health Act, with all the special powers and provisions required, and such parts of the local Act as it may be desirable to retain, should as soon as possible be incorporated in a Bill, and submitted to Parliament.

I have the honour to be,

My Lords and Gentlemen,

Your obedient Servant,

WILLIAM LEE,

*Superintending Inspector.*

*The General Board of Health,  
Whitehall.*